2. Fever, often of an elevated, regular character, but very frequently of an irregular or remittent character, and practically always of a remittent character in the later stages.

3. Absence, usually, of marked dyspnœa and cyanosis.

4. Physical signs which indicate consolidation of a part of a lobe, a whole lobe, or more than one lobe.

5. Pain in the side, with cough and a sputum which is at first typically pneumonic, rusty, and glairy, but which at the end of a week or ten days may assume a greenish tinge and which will be found to contain tubercle bacilli. In the case reported tubercle bacilli were found seven days after the onset.

6. Absence, in some cases at least, of the leucocytosis, usually associated with acute lobar pneumonia.

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SENILE BRONCHITIS.[1]

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To one conversant with the literature of medicine it appears somewhat singular that in the past so little attention has been paid to old age and its diseases, while a chair of pediatrics is now esteemed necessary in every well-ordered medical school. The graduate obtains his information concerning a most important period of life from cursory remarks bearing upon the subject made by various teachers as opportunity may, perchance, offer itself. Of systematic teaching or even of exhaustive treatises upon the subject there are practically none. Yet those of us whose practice is limited to that of a physician-specialist, or, as we preferably term it, that of an internalist, find ourselves often embarrassed in the presence of some well-defined disease which in an elderly subject offers unusual symptoms and signs. While senescence and senility present a large field, any part of which might be profitably tilled, I shall call attention to a small but important portion, offering a few suggestions upon the subject of senile bronchitis. I have chosen this subject partly because of the difficulties and disappointments commonly met with in its treatment, and partly because it is so closely related to other pathological conditions in the respiratory system which is responsible for about one-third of all deaths occurring in the aged.

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It is far from my purpose to occupy much time in reviewing the various theories of senility and death, for these would involve me in a discussion of a correlated mystery—life—and philosophical discussions, although attractive, are not necessary in a paper which aims to be practical; even a definition cannot now be firmly postulated. It matters not whether we agree with Cicero in his masterly *De Senectute*, that old age is a disease, and treat it and of it philosophically, or we follow Canstatt in *Die Krankheiten des Greisenalters*, of 1839, and speak of senile involution as a phase of life, and mingle, as he does, speculation and observed facts, or assent to Day in his *Diseases of Advanced Life*, of 1849, the source of much information and a mine of clinical experience, the fact remains we are dealing with ordinary phenomena of disease modified as to their manifestations by anatomical conditions peculiar to advanced life. I say " phenomena of disease " advisedly, because, while it is impossible to believe that *minus* functional activity may still further diminish and life become extinct, as the flame of a candle is extinguished as it is burnt out, yet this is the exception, and our dealings with old age rest on the assumption of its morbidity and the necessity for therapeutic interference. If old age may seem to be physiological, it is because there is certainly much truth in the saying of my old master Charcot in his *Les Maladies des Veillards*, of 1867, that the " textural changes which old age induces in the organism sometimes attain to such a point that the physiological and pathological states seem to mingle by an imperceptible transition and to be no longer sharply distinguishable," but pathological old age is markedly predominant. When does old age begin? Hippocrates said at seventy, so did Flourens; Canabis puts it at sixty-five; Reveillé-Parise, at fifty-five. That the saying of Cazalis, so often quoted, " one is of the age of his arteries," is not entirely applicable is evident from the fact that a diminution in the respiratory capacity, one of the first signs of senile involution, is present as early as thirty-five or thirty-six. Doubtless the presbyatric physician, if I may be permitted to coin a term, will have his triumph in advancing the time at which senility begins, so that threescore years and ten may be relegated to the mists of tradition, and so may claim equal honor with the pediatrist who has so markedly diminished infantile mortality.

What, then, are the tissue changes of old age? They are (1) a pure atrophy of the constituent elements of the tissues; (2) a progressive infiltration into certain tissues of organic (fatty or albuminous) or mineral (calcareous) elements foreign to their normal condition; and (3) an exaggerated production of connective tissue. Practically, all of these changes are found in the contents of the chest of old subjects. Fatty degeneration of the interalveolar septa results in perforation, the capillary vessels, being thus deprived of their support, atrophy, and the blood-supply is diminished, from production of fibrous tissue, sclerosis results, calcareous degeneration of arteries is frequent, calcification of costal cartilages tends toward diminished expansibility of the chest, and this lack of mobility is enhanced by the diminished power of the muscles. Of the types of senile lung described by Hourman and Dechambre, in 1835, the second seems to me to be that of pulmonary œdema and the third of fibrosis, both manifestly dependent upon circulatory disturbances, and, therefore, secondary. Their first type is, however, worthy of our attention. "In muscular persons with a well-formed thorax, not much altered by the ravages of age, the lungs present little apparent difference from those of the adult, except in the altered position of the great interlobular fissure. The degree of this alteration corresponds with the extent of lateral flattening resulting in diminution of the transverse diameter of the chest. In the adult this fissure lies immediately beneath the upper lobe, and passes obliquely to the root of the lungs, so that on the right side the central lobe occupies exactly the middle part, and in the left side has the lower lobe immediately beneath it (the fissure). But in old age the fissure approximates to the vertical direction, so that one lobe in the left lung is directly in front and the other behind, and the middle lobe in the right lung projects downward, and the lower lobe becomes elevated behind it, so as to form the posterior fourth (or more) of the summit of the organ." The significance of this condition lies in the fact that a senile phenomena which is entirely apical may be seated in the lower lobe of either lung. The contour of the chest is quite characteristic—in its upper portion flattened at the side. The vertical diameter is shortened in consequence of the diminished height of the intervertebral cartilages, and as the anterior portion of these cartilages is more rapidly absorbed we have a forward curvature of the spinal column as a further cause tending, in conjunction with the others, to lessen the capacity of the chest. The intercostal spaces narrow until contiguous ribs come into contact with each other, and may even unite. The costal cartilages calcify and the chondrosternal articulations may unite, thus rendering the chest immobile. These facts present great significance in both symptomatology and therapeutics, as will be seen later. When, in addition, anthracosis, bronchiectasis, and degenerations of bronchial mucous membrane are generally present, the explanation of rapidity of respiration is easy. Of senile pathological pulmonary conditions, four claim our particular attention: bronchorrhœa, bronchitis, pneumonia, and tuberculosis. The ready engrafting of bronchitis upon bronchorrhœa, and the great tendency of the former to become chronic, the easy extension of bronchitis into pneumonia, and the insidious course of tuberculosis in the aged and its unsuspected frequency, necessitates in a discussion of bronchitis an excursion into contiguous fields of investigation. However, this shall be as short as is possible.

The cough in the aged is so frequent and constant a symptom that even the patient comes to look upon it as a necessary evil, and to regard its presence with resignation if not complacency. The cyanotic, wheezing, expectorating old man, overclothed, hugging a warm corner, is a familiar picture. At times he seems to improve—he goes out with confidence--but a change in the direction of the wind, a variation in the thermometer, or an overcasting of the sun, and he seeks his corner again with precipitous haste. For all that his expectoration is generally mucus, yet the mucopurulent variety is not uncommon. His respiration and pulse-rate are accelerated, as in all individuals afflicted with senility, but the former far more than the latter. As for temperature, the axillary is generally normal, the rectal somewhat raised, probably more than the normal difference. The bronchorrhœa of the aged passes, by almost imperceptible steps, into active bronchitis so frequently that the physician is taken by surprise. Chilly sensations, general malaise, increase of cough, local pains, all may be wanting, and yet the rapidly increasing purulency of the sputa, the high rectal temperature, and the duskiness of the face proclaim that bronchitis is present. The respiratory rate may not be much above the normal (for the aged) unless the smaller tubes are invaded, forming the formerly called capillary variety. No auscultatory signs, beyond coarse and fine mucous râles, and occasional sibilant or sonorous râles, are found. In estimating the percussion-note the peculiar resonance developed over calcified costal cartilages and united articulations should be eliminated, as well as various shades of resonance over dilated bronchi. Senile pneumonia is equally insidious, but in this case thorough percussion will develop flatness, frequently at the apex, increased vocal resonance and fremitus, and a higher pitched inspiration confirm the suspicion raised by rapid respiration, marked prostration, and general apathy. To distinguish pulmonary tuberculosis in the aged from senile bronchitis is no easy matter at times, for the former somewhat rarely leads to large cavity formation or extensive infiltration, but is noted for its chronicity and comparative mildness. Bacteriological investigation does not always show bacilli, and observation over some time is needed in case of failure of the microscope to establish the diagnosis. The diagnosis of senile pulmonary tuberculosis may be established only at the necropsy.

Senile bronchitis tends always to become chronic, because senility follows the same course. But whether acute or chronic it behooves us to afford the greatest possible relief to the patient. I do not say cure until it is shown that senility can be cured or even senescence arrested.

In treatment, symptomatically speaking, the amount of expectoration must be lessened. Here belladonna, which yields such brilliant results in childhood, generally fails. The true expectorants, as apomorphine or cocillaña, increase the amount so much that the distress of the patient is augmented, and the fixed chest and weakened musculature militate against the expulsion of the sputum, although it may be more liquid. The nauseating expectorants are liable to interfere with digestion, and for that reason are doubly objectionable. Of the drug remedies, I would place strychnine and ammonium carbonate in the first rank. In acute exacerbations of chronic bronchitis ammonium carbonate, in five or ten-grain doses, given in two or three ounces of milk, not only liquefies secretion, but also stimulates the heart, stimulates the bronchial muscles, and thus relieves venous congestion and dyspnœa. As a rule, its action is more energetic, as Fothergill pointed out many years ago, when the skin is moist. The only disadvantage is, that after a week or more it is apt to disarrange the stomach ; but that period is longer than most patients require its use. For chronic bronchitis and convalescence from the acute form, strychnine sulphate, in from one-fortieth to one-twentieth of a grain, every three to six hours, not only does quite as much as the ammonium salt, but, in addition, is a more powerful stimulant to the right heart, as was shown years ago. Contrary to what is generally supposed, it is not a vasomotor constrictor, and, therefore, does not increase the work of the heart. Besides, this drug improves nutrition by stimulating the spinal cord and peripheral nerves and the respiratory centre, aids digestion, and is, in a limited way, a gastric antiseptic. To disinfect the expectoration, creosote carbonate, in twenty-drop doses, given in two ounces of sherry, repeated every four hours until purulency disappears, is effective. Ordinary creosote should never be given to the aged, because of its irritant effect on the kidneys. With copious secretion and difficult expectoration this is the drug of choice, frequently preventing the low fever from absorption of putrid material, which so often occurs. In this connection I would most strongly condemn the use of opium, or any of its alkaloids, which is directly responsible for either speedy death from asphyxia (simply drowning the patient in his own secretion), or more gradually in producing this absorption, to which allusion has been made. Opium relieves cough by rendering the patient unconscious of its cause, and lulls the physician into a feeling of false security.

Naturally, associated conditions as gout, cardiac or renal disease, should receive attention.

Of physical measures, massage yields the most brilliant results. Systematic general massage, especial attention being paid to the chest, will increase chest expansion, improve nutrition, and not only facilitate expectoration, but diminish its formation. A warm, dry atmosphere is essential. An artificially dry atmosphere can be obtained in the patient's own room by exposure of calcium chloride or strong sulphuric acid in shallow earthen receptacles. Dust, so common in our city houses, must be filtered out, else asthmatic symptoms will become severe. This can be done at the inlet of the warmed air, or by the wearing of a Robinson respirator. Inhalations of steam, benzoinated liquids and similar remedies have always been failures in my experience. Camphor as a tincture is, however, an exception. Wool should be worn next to the skin, and the feet should be kept warm. "Taking cold" can be avoided by vigorous cutaneous friction with the flesh brush, practised daily, and inunctions of vaseline to the back of the neck and soles of the feet. To avoid night asthmatic attacks, and chilling during them, hearty evening meals should be discouraged—a meat diet is preferable. Unless the patient is a habitual drinker, alcohol should be sparingly used, and my preference is for a good port. Quite essential is a free movement of the bowels, best obtained by increasing the strychnine and the occasional use of the pharmacopœial compound vegetable cathartic. As for muscular exercise, much depends upon the habits and the strength of the patient. If chilling can be avoided it should be encouraged.

In this somewhat hasty review of the salient points in the presentation of senile bronchitis I trust the important points will not be lost sight of, and they are these:

1. Careful diagnosis.
2. Use of strychnine and ammonium carbonate.
3. Prohibition of opium.
4. Systematic massage.
5. Improvement of the general health. By giving close attention to our patients suffering from a condition sufficiently common not to attract careful study, I am sure we can do much not only to preserve life, but also toward making the last days of these patients their best days, and delay their passage by smoothing their way toward the end which awaits all mortals.